IAF SYMPOSIUM ON INTEGRATED APPLICATIONS (B5)
Tools and Technology in Support of Integrated Applications (1)

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APPLYING GEOGRAPHIC INFORMATION SYSTEMS FOR MONITORING OF BLOOM
DYNAMICS FROM SPACE

Abstract

Water-related issues is one of the major challenges in the 21st century. One of the significant concerns is the formation of blooms. The development of blooms is caused by various environmental factors, such as temperature, sunlight, and ecosystem disturbance. Additionally, due to the excessive use of fertilisers, blooms can be formed and rapidly multiply in warm and slow-moving waters. Hence, nutrient-rich and sunlight environment play a crucial role in the unbridled sprawl of cyanobacteria. These harmful algal blooms may form toxins, known as cyanotoxins which causes severe damage on the public health and the ecosystem alike in developing regions. Due to unestablished dynamic behaviour of the blooms, implementing an analytical approach by studying each of the aforementioned factors is a strenuous. Therefore, it is an essential matter to implement geostatistical analysis tool to study the change of the cyanobacteria formation, its movement, and impact on the nearby population. Also, this facilitates the visualisation of the affected areas and population and would assist the generation of maps of the potential affected areas or areas at risk. This paper provides a monitoring strategy tool and a framework of how to monitor the bloom dynamics from space and provide a smart geo-analysis of the potential affected areas and the estimated number of affected population. We review how to monitor the cyanobacteria formation from space and by enabling geostatistical analysis to be performed, we can early predict the cyanobacteria formation. This, in turn, will act like an early warning system for the nearby population and whom it might affect.